JSC team develops program that provides X-38 systems insight

By John Ira Petty

A flexible, effective monitoring and control program with wide applications for the X-38 project has been developed by the Automation, Robotics and Simulation Division of the Engineering Directorate at JSC.

The program, called Portable Diagnostic Terminal software, uses National Instrument Co.'s Labview language to enable an IBM Thinkpad to monitor systems of the prototype X-38 before and after flight and provide limited pre- and post-flight command capability.

Frank Delgado of the Engineering Directorate headed up the software development project, which took less than a year.

"The approach we used minimized the number of engineers needed to create the software," Delgado said. "We used an object-oriented approach to develop a common set of displays that could be used to create other monitoring applications."

The software is used on the ground to monitor the X-38's health and status before flight tests. It can turn systems on and off.

During flight tests, while the X-38 is attached to the wing of a B-52, the terminal with the new software is wired to the vehicle and is used to prepare it

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JSC Photo 98e07126 by Mark Sowa

Debbie Buscher, left, and Frank Delgado show the laptop computer that can provide monitoring and limited control of the X-38 crew return vehicle prototype during flight tests. In the background is an X-38 prototype, which will be flown aboard a space shuttle for on-orbit testing.

Thirteen to work early space station assembly missions

Thirteen astronauts have been named to support upcoming shuttle missions, STS-96, -97 and -98, slated for launch next year and dedicated to continuing the on-orbit construction of the International Space Station.

Three-time shuttle astronaut Kent Rominger, a Navy commander, will lead the crew of STS-96, a logistics and resupply mission for the International Space Station targeting a mid-May 1999 launch. Rick Husband, an Air Force lieutenant colonel, will join Rominger on the flight deck of *Discovery* as pilot. Mission specialists for the planned 10-day flight are Ellen Ochoa, Ph.D., Tammy Jernigan, Ph.D.; Daniel Barry, M.D., Ph.D.; Canadian Space Agency astronaut Julie Payette; and Cosmonaut Yuri Malenchenko, a Russian Air Force colonel.

STS-96 will follow the launch of the Zarya control module on a Russian vehicle in November 1998; the STS-88 mission in December 1998, delivering the American-built Unity module and two docking adapters; and the arrival of the Russian Service Module in April 1999. During STS-96, *Discovery* will carry a variety of logistical and resupply items to ready the station for the arrival of the first resident crew in July 1999. The shuttle will spend seven days docked to the uninhabited station, and Jernigan and Barry will conduct at least one space walk.

Brent Jett, a Navy commander, will lead the crew of *Endeavour* for STS-97 in August 1999, continuing construction of the station. He will be joined by pilot Michael Bloomfield, an Air Force major, and Mission Specialist Marc Garneau of the Canadian Space Agency. Astronauts Joseph Tanner and Carlos Noriega, a Marine Corps major, named to the mission in June 1997, will conduct two space walks.

The fourth American mission, STS-97 will deliver the first set of U.S.-provided solar arrays and batteries as well as radiators to provide cooling. The shuttle will spend five days docked to the station, which will be staffed by the first station crew. Two space walks will complete assembly operations while the arrays are attached and unfurled. A communications system for voice and telemetry also will be installed.

In October 1999, *Discovery* will continue expansion of the station when Kenneth Cockrell commands STS-98. Cockrell will be joined by Pilot Mark Polansky, and Mission Specialist Marsha Ivins. Astronauts Mark Lee, an Air Force colonel, and Thomas Jones, Ph.D., previously named to the mission, are training for three space walks.

STS-98 will mark the arrival of the U.S. laboratory module, which will become the centerpiece of scientific research on the station. The shuttle will spend six days docked to the station while the laboratory is attached and three space walks are conducted. The laboratory will be launched with five equipment racks aboard, which will provide essential functions for station systems. ■

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Shoulder to Shoulder

and the Houston Forum Club to support a 40th anniversary tribute to NASA on November 4.

Joe Mayer, the Boeing external and community relations director, has chaired this new arm of the Clear Lake Area Economic Development Foundation's Aerospace Advisory Committee for the past year. He says Team NASA provides "a sense of shared ownership, and a sense of shared pride and responsibility for making these community activities successful."

Mayer explains that JSC contractors are in a variety of competitive and cooperative situations from week to week in their business areas, but that this is one area where they can all come together to support the community and JSC.

> ***'There's more involvement by more contractors than there ever has been in what traditionally were government-only activities.'***
>
> **– Tom Short, Johnson Engineering**

The Team NASA charter calls for "a seamless partnership with JSC to enhance employee, contractor and community activities by providing coordinated planning, organization, communication and a process to review events and determine the overall value to all participants," said Jim Reinhartsen, economic development foundation president, who volunteered his organization as a clearinghouse for the Team NASA activities.

The new group offers opportunities in many areas, its participants report. In addition to helping with logistical planning and coordination for events, Team NASA also encourages a community ethic, improves communication among NASA and its contractors, provides opportunities for networking inside and outside the aerospace industry for companies large and small, and promotes an image to the outside world of a unified, cooperative force for the future.

The group works by having regular meetings to stay informed about upcoming events and activities, and to prioritize expenditure of its limited resources. Once an event is given priority, one team member is assigned as a "shepherd" for the event and works closely with their NASA contact to coordinate the community's participation. Both the contractor community and JSC bring people and resources.

"We probably didn't do all of the things in the past we should have to make the JSC community operate as one team," says Harv Hartman, JSC's Human Resources director and a Team NASA participant since its inception. "It's really the whole business of organizing, planning and executing as a team rather than just talking as a team. I don't think we have acted on that general feeling and mobilized our people for different events."

"This is common sense," Reinhartsen says. "The government employee's perception of something is usually a little bit different than the contract employee's. The aerospace employee's perception of something is usually a little bit different than the banker or the fellow who sells cars. But by having this Team NASA concept, you use different perceptions and different inputs to become a much broader community. You blend the approaches and you end up with a better product."

"Prior to this, your typical contractor participation events would have been limited to the on-site contractors because they're the only ones that would have seen the flyers, seen the postings and had access to some aspects of the JSC home page," said Sandy Johnson, president of Barrios Technology Inc. and another Team NASA founder. "Now you're opening up and broadening that to off-site contractors as well. In the long run, that will be one of the major benefits.

"We don't have the resources necessarily to participate extensively. Where previously we may have chosen one or another, now we can participate in all the activities JSC has," she says.

Another such event, said Estella Gillette, JSC's Equal Opportunity Programs director, was American Heritage Week, a celebration of the center's cultural diversity."

"The greatest pleasure for me was to see not only the cultural diversity of the attendees, but also the representation of companies, organizations and disciplines, that make us come together for a common goal."

Jim Adamson, chief operating officer for United Space Alliance, cautions that Team NASA can't solve all of the community's problems. However, he said, it is an effective way of breaking down communication barriers by providing a single forum for prioritizing activities that have the greatest impact on the community and enhancing the value of the contractor and NASA efforts in supporting those activities. ■

List of Team NASA Companies

AeroSys Consulting
Barrios Technology
Born Wild Innovations Promotions
Brown & Root
Cimarron
Dynacs Engineering Co.
GB Tech
GeoControl Systems, Inc.
GHG Corporation
Hamilton Standard
Hernandez Engineering
Honeywell
Intermetrics, Inc.
Johnson Engineering
Johnson Space Center
Lockheed Martin
MRI Computer Services
Northrup Grumman Technical Services
Oceaneering Space Systems
Raytheon Systems Co.
SPACEHAB, Inc.
Spar Operations and Engineering
The Boeing Company
Thiel Manufacturing & Supply
United Space Alliance
Wyle Laboratories Life Sciences

Pictured on Page 1, from left, are: Frank Fort, Brown & Root; Pete Canga, Hamilton Standard; Jackson Routt, Brown & Root; Janet Gouveia, Intermetrics; Jayant Ramakrishnan, Dynacs; Mark Gittleman, Oceaneering; Michael Zarcaro, GeoControl; Tim Kropp, MRI; Darla Racz, Barrios; Mike Hernandez, Hernandez; Kathy Reeves, Wyle Labs; Harv Hartman, JSC; Dee Williams, Barrios; Kimberly Campbell, SPACEHAB; Pat Patton, Born Wild Innovations; Joe Mayer, Boeing; Dorothy Lorence, Lockheed; Robbie McAfoos, Honeywell; Wendy Starr, Boeing; John Bailey, GB Tech; and Piper Landgrebe, Lockheed.